FURTHER NOTES ON ACARI [1]

BY

Dr. A. C. OUDEMANS.

with Plates 5 and 6.

1. **List of Acari**, collected by Mr. C. FISCHER near Macognaga.

By the courtesy of Mr. S. A. Poppe, of Vegesack, I was enabled to examine a few *Acari*, collected by his brother-in-law Mr. C. Fischer, of Mülhausen, in 1893, under stones and decaying leaves near Macognaga, on the southern (Italian) slope of the Monte Rosa, at about 1200 meters above the level of the sea.

These *Acari* are:

1. *Oribata verticillipes* (Nic.) (non Michael!) 3 ex.,
2. *Camisia Fischeri*, nov. sp., 1 ex.,
3. *Parasitus crassipes* (L.), 1 ex., tritonympha,
4. *Cyrtolaelaps cornutus* Berl., 1 ex.,
5. *Hologamasus calcaratus* (C. L. Koch.), 1 ex.,
6. *Erythraeus phalangoides* (de Geer), 5 ex.,
7. *Coeculus echinipes* Duf., 5 ex.

2. **Camisia Fischeri** nov. sp.

This species should be intercalated into the dichotomical table of *Camisia* (*Nothrus* Das Tierreich, Oribatidae) as follows:

16.	Central projection with tubercles at corners each bearing one hair — 16*a*.
	Central projection with tubercles at corners each bearing two hairs — 16*b*.

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[1] Why I use other names than those of Das Tierreich will be explained in one of my following papers. O.

16*a* = 16 of the table.

16*b*. A subelliptical raised ridge on dorsum of abdomen without transverse ridge within — 16*c*.
A subelliptical raised ridge on dorsum of abdomen with one transverse ridge within — (*Camisia horrida* of Berlese) *Camisia Berlesei* Oudms.

16*c*. Apophyses of central projection curved outward — (*Camisia horrida* of Nicolet) *Camisia Nicoleti* Oudms.
Apophyses of central projection straight, quadrangular — *Camisia Fischeri* Oudms.

This new species (Plate fig. 1—5) is closely allied to *Camisia horrida* of Nicolet and *Camisia horrida* of Berlese, for I consider these two being different one from another, different from the true *horrida* of Hermann, and different too from *biverrucata* of Koch.

Length 1,16 millimeters.

It agrees with *horrida* of Nicolet, by having two hairs on the central abdominal apophyses, and the central longitudinal depressed area not divided by any transverse elevation or fold. It differs from Nicolet's species by the shape of the ridges on the cephalothorax and by the shape of the central abdominal apophyses.

It agrees with *horrida* of Berlese by having two hairs on the central abdominal apophyses, and by the shape of these apophyses. It differs from Berlese's species by the shape of the ridges on the cephalothorax and by the central longitudinal depressed area not being divided by any transversal elevation or fold.

The apophyses on the sides of the rostrum are cylindrical at their distal, flattened at their proximal end.

The cephalothorax shows two ridges, running from the pseudostigmata forward, converging, but not touching one another. Behind the rostrum the cephalothorax suddenly widens and rises, forming a strong transverse edge, slightly bowed forward; the edge being inconspicuous in the centre. The pseudostigmata are tubular and slightly projecting. The pseudostigmatic-organ (see fig. 2) is torch-shaped, its distal third shows a configuration as if it were somewhat longitudinally carved Interlamellar hairs near the base of the pseudostigmatical-organs, very small, feathered.

The abdomen's dorsal surface is flat, but divided into three depressions by the lateral margins being somewhat bent upwards and by two longitudinal folds of the skin, or ridges; these two ridges become inconspicuous forward and gradually pass one into the other hindward by bowing towards the median live. Three pairs of transversal ridges segmentally arranged divide the two lateral depressions into smaller parts, imperfectly, for they neither attain the longitudinal ridges nor the lateral margins, except probably the hindmost pair of ridges. From the hindmost part of the longitudinal ridges towards the outer corners of the abdomen two other ridges run. In my specimen there is still another ridge, viz. (see my fig. 1.) in the right depression, which we do not observe in the left depression.

I believe that these ridges are of no great value, and that they will disappear the more the animal is fed. But I have no material to settle this question.

I have carefully examined the dorsal surface on hairs. The lateral margins bear 4 hairs. The fore-margin 4 smaller hairs, or 6 if you include the two foremost marginal hairs. The distance between these 6 hairs is different, as our figure clearly shows. The place of the hairs is exact in my figure, for I have used the *camera lucida*. On the outside of the two longitudinal ridges we observe 3 pairs of smaller hairs, and near the two fourth marginal hairs a very small hair is scarcely perceptable and directed forward. The hinder edge of the abdomen bears two apophyses with a strong hair, the proximal end of which is smooth, the distal and greater part is provided with protuberances, which give to the hairs a feathered aspect. The ventral part of the animal projects behind the hinder edge of its dorsal surface, and shows two quadrangular apophyses bearing two hairs each, of which the outer are smaller than the inner ones. *All the hairs are feathered.*

The ventral surface of the animal (see fig. 3) shows us the epimera, touching one another on one side, the epimera of both sides leaving, however, between them a free space. The genital plates perfectly pentagonal, show 7 pairs of minute smooth hairs near the border of the aperture, and one pair of minute smooth hairs close to the hind corners of the pentagon. Anal plates nearly touching the pentagon of the genital plates, provided with 4 pairs of minute smooth hairs. On the sides of the anal plates the ventral plate bears two pairs of minute feathered hairs. The dorsal plate or notogaster is considerably sufflexed on to the ventral side, and bears on this side two pairs of feathered hairs, as shown in our figure.

The legs bear feathered hairs, except a few hairs on the tarsus The claws are tridactyle (fig. 4).

The surface of the cephalothorax, epimera, genital, anal and ventral plate is smooth, that of the notogaster and of its ventral sufflexed part is sculptured, as is shown in fig. 5.

3. **List of Acari**, collected by Mr. A. R. Spoof near Astrachan and near or in °Abo (Finland).

Mr. A. R. Spoof, of °Abo, was kind enough to send me some Acari for determination.

These are.

1. *Scutovertex spoofi* nov. sp. — adult and nympha. —

2. *Macrocheles* (*Holostaspis*) *marginatus* Herm., trito-nympha ♀ (= *Gamasus badius* Koch); it was attached to a fly, *Musca domestica* L., in °Abo, Finland, 1895. — 1 ex.

3. *Argas reflexus* Fabr., found by him in a farm in the Russian village Ssamjáni, near Astrachan, 1879. — 1 ex.

4. **Scutovertex spoofi**, nov. sp.

The dichotomical tabula of *Scutovertex* (Das Tierreich, Oribatidae) should be altered as follows:

4 { Psstg. org. with short peduncles and small globular head; Ung. trid. — 5.
No Psstg. org. visible. — *4a*.
4 a { Ung. mond. — L. 620 μ. *S. bilineatus*.
Ung. tridactyle. — L. 760 μ. *S. spoofi* Oudms.

This species was found by Mr. A. R. Spoof in spawn of Lymnaea in subsaline water, 26 July 1896. (fig. 6—16).

Length 0,760 millimeters.

The dorsal surface of the cephalothorax shows dark-coloured ridges, which are better figured (fig. 6) than described. There are two lamellar hairs or bristles and two rostral hairs. The skin is smooth.

No pseudosticmatic organs nor pseudostigmata are discernible.

The dorsal surface of the abdomen is convex, sculptured as shows us fig. 7. As far as the opake animal permitted to discern, the short bristles, in toto 18 in number, stood in longitudinal and curved transversal rows, as fig. 6 shows us. The colour of the cephalothorax and a quadrangular area of the abdomen is brown, the abdomen itself darker brown, and its margins nearly black.

The claws (fig. 9 and 10) are tridactyle and very heterodactyle, the central claw being almost twice thicker than the lateral ones. Moreover the tarsus bears four thick hairs hooked at their end, so that each tarsus actually ends into seven hooks, which may be very useful to the animal in crawling on the slippery submerged stems of aquatic plants, for else I cannot explain the presence of these claws and crooked hairs. I believe that the occurrence of these mites in the spawn of Lymnaea is accidental; they feed on vegetables.

The ventral surface (fig. 8) scarcely shows demarcations of the epimera, or a division of the sternum by apodemata. The genital covers form together a square; and each of them bears on its free margin four minute hairs. The anal covers form together a trapezium; each of them bears, as for as I could discern, only one minute hair near the free border, or anal split. The ventral surface is smooth and dark brown coloured, the margins being almost black.

The legs have only a few bristles, except their tarsus, which is described above.

The *nymph*. Length 0,795 millimeters.

The nymph has a leathery skin like the species of the genus *Camisia*. The dorsal surface (fig. 11) shows us a cephalothorax with representatives of the lamellae, being here only tickened ridges of the skin. There are two short curved lamellar hairs and two short curved rostral hairs. The pseudostigmata are circular, do not project, and bear short, scarcely club-like pseudostigmatic organs.

The dorsal surface of the abdomen is wrinkled on the sides, shows a thickened ridge at the boundary of the cephalothorax and two transversal and two longitudinal ridges, as delineated in fig. 11. Six hairs on the fore-margin, and four transversal rows of four hairs each adorn the dorsal surface of the abdomen, the four rows being bowed backward; the hairs are long-spatulate (fig. 14). The surface of the cephalothorax is scaled as it were (fig. 12); that of the abdomen minutely wrinkled (fig. 13).

The ventral surface (fig. 16) of the cephalothorax distinctly shows divisions for the legs (epimera). The epimera of each side are contiguous, leaving a free median space. The genital covers form an oval, each bearing seven minute hairs near their free border, and two longer hairs or bristles. The anal aperture is very oblong-oval; its covers do not show any hair, but on the sides of the aperture we observe one little hair. The posterior margin of the abdomen bears two spatulate hairs, curved towards the centre.

The legs (fig. 11) are quite *Camisia*-like, and bear thick, almost club-like hairs, all curved towards the distal end of the leg. These hairs show very minute notches (fig. 15). Only the tarsus has several small, and the tibia one long smooth hair.

5. **List of Acari** collected by Mr. J. D. Alfken, of Bremen.

Mr. J. D. Alfken, of Bremen, kindly sent me the following Acari.

1. *Poecilochirus fucorum* DE GEER, nympha coleoptrata speciei quaedam, on *Carabus monilis*, Bremen, 27, 8, 1899, 1 ex., and on *Carabus cancellatus*, Bremen, 11, 9, 1899, 11 ex.

2. *Holostaspis marginatus* HERM., feminae tritonympha, on *Musca domestica*, Bremen, 18, 9, 1899, 1 ex., 7, 10, 1899, 1 ex., and 12, 10, 1899, 4 ex.

3. *Polyaspis patavinus* G. and R. CAN, nympha homeomorpha

pedunculata, on *Criocephalus ferus* Kr. (*epibata* SCHIÖDTE), Bremen, 31, 8, 1899, 11 ex.

4. *Uropoda ovalis* (C. L. KOCH), nympha pedunculata, on *Criocephalus ferus* Kr. (*epibata* SCHIÖDTE), Bremen, 31, 8, 1899, 6 ex.

5. *Trichotarsus alfkeni* nov. sp., hypopus, on *Xylocopa circumvolans* SMITH, Kobe, Japan, 21, 8, 1891, 25 ex.

6. *Trichotarsus japonicus* nov. sp., hypopus, on *Xylocopa circumvolans* SMITH, Kobe, Japan, 21, 8, 1891, 1 ex.

7. *Trichotarsus ornatus*, nov. sp., hypopus, on *Xylocopa circumvolans*, SMITH, Kobe, Japan, 21, 8, 1891, 1 ex.

6. **Uropoda ovalis** (C. L. KOCH).

I give here a more detailed description and a better figure than are hitherto published.

Length 0,485 mm.

Nympha homeomorpha pedunculata. Shape oval; dorsum convex, smooth, with markings like those on the ventral plate (fig. 17) and numerous minute hairs; only the border is flat, provided with regularly placed minute hairs, like so many other *Uropoda.* The most striking specific character is the strange peritrema. The stigma is situated in the foremost part of the pit for the saving of the third leg. The peritrema extends on both sides of it: firstly straight hindward within the said pit, ond secondly forward till near to the head. This end first bends towards the border, then runs along it, till the pit of the second leg. Here it bends inward, running with a bow with the concavity turned towards the border, on the bottom of the said pit; when it has again reached te border, it follows this up to the spot where the border suddenly becomes very narrow.

Six specimens hung on the body of *Criocephalus ferus* Kr. (*epibata* SCHIÖDTE). Found in Bremen, 31, 8, 1899.

7. **Trichotarsus alfkeni**, nov. sp.

Only the hypopus known to me. Fig. 18—20.

Length varying between 0,238 and 0,325 millimeters.

Breadth varying between 0,202 and 0,261 millimeters.

Measured on 25 specimens, all found on *Xylocopa circumvolans* SMITH, of Japan.

The species (fig. 18) resembles *Trichotarsus xylocopae* DONNADIEU. The 1st, 2d and 3d legs have 2 claws, of which one is enormous, much stronger than that of *Trich. xyl.*, and one small, forming together pincers. The 4th leg ends into two hairs, of which one is very long, 0,543 millimeter (in a specimen of 0,325 mm. length) and one smaller, 0,108 mm, consequently one fifth of the longer one. The hairs of the dorsal surface are much stronger, stiffer and blunter than those of *Trich. xyl.* The dorsal shield is sufflexed to the ventral surface with one median fluted border (fig. 19); this border lies *under* the oval suckerplate (between this plate and the body). The chitinous hind-margin projects as a strong chitinous bar forward, which lies on the inner surface of the dorsal shield, and is much longer than that in *Trich. xylocopae.*

The dorsal surface is exactly wrinkled in the same manner as in *Trich. xylocopae.* Purposely I have therefore omitted these markings in my figure of *Xyl. alfkeni.*

Further the dorsal surface shows several symmetrically and segmentally placed spots, without any indication of minute hairs; perhaps they are pores.

The ventral surface (fig. 19) shows the chitinous frames, nearly exactly a copy of those of *Trich. xyl.*, but stronger; moreover the pieces marked with *a a* and *b b* are absent in *Trich. xyl.* (at least in my two specimens, bought from Mr. Bourgogne in Paris). The arrangement of the anal suckers is different too. In *Trich. xyl.* the four greater suckers form nearly a straight transversal row. Here, in *Trich. alfkeni* they are placed so, that the two outer form with the hindmost ones a nearly straight row with a slight concavity forward. Before the two largest suckers we observe two minute ones. The hairs of the ventral surface, arranged somewhat different from those of *Trich. xyl.* are flat, lanceolated, with a filiform distal end, except two on the animal's flank, of which one is long and stiff, like those of the dorsum, and one short poniard-shaped.

Fig. 20 shows us 6 different aspects of the two claws.

The so called second claw of *Trich. osmiae* is quite another organ, viz. a prolongation of the distal end of the tarsus, not comparable with the second claw of *Trich. alfkeni!*

We observe, that occasionally the second claw may become invisible, and this is especially the case when the animal has retracted its legs; we must therefore be very careful in deciding whether the animal is mono- of didactyle.

8. **Trichotarsus japonicus** nov. sp.

Only the hypopus is known to me. Fig. 21.

Length 0,217, breadth 0,198 millimeter.

One single specimen, found on *Xylocopa circumvolans* Smith, of Japan.

The animal resembles *Trichotarsus alfkeni*, but differs from it by the following peculiarities It has only *one* claw, like all the known species of *Trichotarsus.* This claw is much smaller than that of *Trich. xylocopae* or of *Trich. alfkeni.* The tarsus of the first three pairs of legs shows, exactly as in *Trichotarsus osmiae* Donnadieu, a strong chitinous projection. This projection is called a second claw by Kramer and Canestrini (Das Tierreich, Sarcoptidae). They are wrong, for this projection is *immovable*, whilst a claw is movable. The projection is in my figure 21 visible on the 1st, 2d and 3d left and on the 3d right legs.

The tarsus of the first three pairs of legs bears two beautifully curved, lanceolated hairs, like those of *Tyroglyphus mycophagus* Mégnin. The proximal end of these lanceolated hairs is cylindrical, the distal one very flat.

Dorsal and ventral surface are exactly those of *Trich. alfkeni.*

The tarsus of the 4th pair of legs ends into two hairs, of which one is very long, 0,400 mm., and the other 0,050 mm, consequently one eighth of the longer one.

9. **Trichotarsus ornatus**, nov. sp.

Only the hypopus known to me (Fig. 22 and 23) in one specimen, found on *Xylocopa circumvolans* Smith, of Japan.

Length 0,334, breath 0,210 millimeters.

This *Trichotarsus* is quite different in shape from *Trich. xylocopae*, *osmiae*, *bifilis*, *alfkeni*, and *japonicus*, and perhaps resembling *Trichotarsus trifilis*, for the description given by Canestrini in Termeszetrajzi Füzetek, vol. 20, p. 473, fitts exactly on my specimen. Yet, I believe that my species is a new one, as Canestrini has not mentioned the most striking characters. They are 1. there is a transverse furrow between the 2d and 3d pairs of legs. 2. There are two dorsal shields, one cephalothoracical and triangular, and one abdominal and nearly half an oval in shape. 3. The sculpture of the dorsal surface widely differs from that of all the other *Trichotarsus*, as may be seen in my fig. 22. 4. The tarsus of the first three pairs of legs bear four leaf-like hairs each. 5. the disk with suckers projects beyond the animal's hind margin (fig. 22 and 23). 6. The chitinous frames on the ventral surface of the animal show an arrangement as I have not yet seen in Acari (fig. 23).

Moreover we observe the following other peculiarities. There are two minute hairs on the cephalothorax and two ditto on the ventral surface between the epimera of the 2d and 3d pairs of legs and close to the left and right border of the abdomen. Hind margin of abdomen with three pairs of hairs of which the median ones are the longest. Between the two epimera of the first leg, between those of the third and fourth legs, and between the epimeron of the fourth leg and the sucker-disk, the ventral surface shows minute circular spots, which probably are pores. The tarsus of the 4th leg bears 5 hairs besides the minute unguis, with which all the legs are provided. The lengths of these hairs are 0,326, 0,253, 0,145, 0,056 and 0,032 millimeters.

I propose the following change in the dichotomical table of Das Tierreich, Demodicidae and Sarcoptidae, p. 148:

a) Uebersicht der Arten auf Grund der Wanderlarven:

1 { An allen B. eine sehr schwache Kralle; Umriss des Tieres oval; Rücken ohne Borsten — 2.
An den 3 vorderen B. starke Krallen; Umriss des Tieres fast rund; Rücken mit Borsten — 3.

2 An den 3 vorderen B. je 4 blattförmige Haare. 1. *T. ornatus.*
An den 3 vorderen B. keine solche . . . 2. *T. trifilis.*

3 Zwei Rückenschilden, von denen das vordere dreieckig ist . . . . 3. *T. osmiae.*
Nur ein Rückenschild auf den hinteren Fläche des Rückens. — 4.

4 An den 3 vorderen B. je 2 Krallen . . . 4. *T. alfkeni.*
An den 3 vorderen B. je 1 Kralle. — 5.

5 Am Endglied des 2. HB nur eine Endborste. 5. *T. xylocopae.*
Am Endglied des 2. HB. zwei Endborsten.—6.

6 An den 3 vorderen B. je 2 lancettförmigen Haare. 6. *T. japonicus.*
An den 3 vorderen B. keine solche . . . 7. *T. bifilis.*

10. On some Italian Acari.

In 1883 I bought from Mr. André in Beaune (France) some Acari, collected by Prof. Berlese, and preserved in glycerine.

In one of the tubes two *Erythraeus* were enclosed, under the name of *Rhyncholophus cardinalis.* They are, however *Erythraeus miniatus* (Herm.) They were found by Prof. Berlese in Sicilia.

In another tube there were two Acari, with the name *Leiosoma fusifer.* One of these two is really *Serrarius fusifer* (C. L. Koch), the other, however, *Serrarius microcephalus* (Nic.). Hitherto this species is not known from Italy. The tube was ticketed « Padova ».

In a third tube were two Acari, marked with the label: « *Cepheus minutus*, Padova. » Berlese describes in his Acari, Myriapoda et Scorpioni, fasc. 35 n⁰. 7, *Eremaeus ovalis* Koch, with the synonym *Cepheus minutus* Koch. In comparing my two specimens with this description and figure, I saw some differences, viz. the pseudostigmatic organs were shorter and ended more globular, and the diagonal ridges or folds of the skin on the hind part of the abdomen's dorsum were absent. In preparing these Acari for my collection, I accidentally crushed them. I have however found in August several specimens *of exactly the same species* in decaying leaves, near Haarlem. Notwithstanding the above mentioned little differences, I consider the two Acari bought from Mr. André and my specimens of Haarlem really to be *Scutovertex ovalis* (BERL.) I doubt of the existence of the diagonal folds in this species and suppose, that the animal, delineated by Prof. BERLESE, has got these strange wrinkles as it was just hatched from its last ecdysis, when it was thrown in spirits. MICHAEL too considers *Scutovertex ovalis* (BERL.) as a doubtful species (Das Tierreich, Oribatidae). For this reason I think it useful to present to my readers new figures of this species (fig. 24—31).

Length from 0,540—0,620 mm. Breadth 0,360 mm.

Fig. 24 shows the animal's dorsal face. The prolonged anterior portion of the abdomen gradually passes into the cephalothorax. The nearly quadrangular spot on it is yellow. Before this spot the prolongation of the abdomen still sends a little chitinous bar into the skin of the cephalothorax. This median bar is delineated by Prof. BERLESE in his *Eremaeus ovalis* var. *siculus* (fasc. 35, n^0. 8).

The abdomen is convex, rough, marked with numerous irregular granules (fig. 27), even on the radially striated peripheral band (fig. 24 and 26). The dorsum shows 4 longitudinal rows of 4 hairs each. These hairs also stand in transversal (segmental) rows (fig. 24). Four hairs on hindmargin of abdomen.

Fig. 25 shows the ventral surface. My figure, exactly delineated with camera lucida, differs somewhat from that of BERLESE. The whole ventral surface is marked with the same spots or granules, as the dorsal one. The genital covers bear one hair each, the anal covers two hairs each. The ventral plate shows wrikles and seams to be leathery.

Fig. 26 is a side-view, which demonstrates the peripheral band to be convex with the arched central portion of the abdomen, not flat, as in *Scutovertex maculatus* MICH.

Fig. 28 is a side-view of the lamella with the lamellar hair and a very small lamellar cusp.

Fig. 29 is a side-view of the first leg; the tibia is provided with the singular prolongation, delineated also by Prof. BERLESE.

Fig. 30 is a drawing of one of the hairs of the abdomen, and

Fig. 31 represents a pseudostigmatic organ; as will be seen it resembles more that of *Scutovertex ovalis* var. *siculus*, than that of the type (conf. Berlese, A. M. S. 35, 7 and 8).

I propose to change the «key» on page 29 of Das Tierreich, Oribatidae, as follows:

1 Ung. monod. — 2.
  Ung. trid. — 3.

2 No Psstg. nor Psstg. org. . . . . 1. *S. bilineatus.*
  Psstg. and Psstg. org. present . . . . . 2. *S. caelatus.*

3 No Psstg. nor Psstg. org. . . . . 3. *S. spoofi.*
  Psstg. and Psstg. org. present — 4.

4 Lam. and Trlam. thickened bars, or ridges, or scarcely visible. — 5.
  Lam. blade-like. — 7.

5 2 indentations in post. margin of Abd., a spine in each. . . . . 4. *S. harioti.*
  No indentations in post. margin of Abd. — 6.

6 Dors. of Abd. slightly arched . . . . . 5. *S. corrugatus.*
  Dors. of Abd. with arched centre and broad, flat, peripheral band . . . . 6. *S. maculatus.*

7 C. lam. long., blunt, curved . . . . . 7. *S. sculptus.*
  C. lam. very short, hardly existing . . . 8. *S. ovalis.*

11. **List of Acari** collected by Mr. S. A. Poppe.

Mr. S. A. Poppe, the well-known author of Myobia-studies, gently procured me the following Acari.

1. *Dermanyssus gallinae* (de Geer). — On *Gallina gallus* L., Varel, 6 ex.

2. *Leiognathus arcuatus* (C. L. Koch) — On *Vesperugo pipistrellus*, Lemforde, and on *Vespertilio murinus*, Vegesack, 11 ex.

3. *Celeripes vespertilionis* (L.). — On *Vesperugo serotinus*, Vegesack, and on *Vespertilio murinus*, Vegesack, 11 ex.

4. *Laelaps agilis* (C. L. Koch), nympha generans. — On *Arvicola arvalis*, Vegesack, 24 ex.

5. *Parasitus coleoptratorum* (L.), nympha coleoptrata. — On *Arvicola glareolus*, Fuchsberg, June, 1 ex.

6. *Syringophilus bipectinatus* HELLER. — On *Anas boschas* L., Vegesack, 40 ex.

7. *Notoedres notoedres* (MÉGN.). — On *Mus decumanus*, Vegesack, 3 ex.

8. *Prosopodectes poppei* (OUDMS.) — On *Vespertilio murinus*, 5 ex.

9. *Listrophorus pagenstecheri* HALLER. — On *Sciurus vulgaris*, Vegesack, numerous ex.

10. *Listrophorus leuckarti* PAG. — On *Arvicola amphibius*, Vegesack, numerous ex.

11. *Myocoptes musculinus* (C. L. KOCH). — On *Mus musculus*, Vegesack, 20 ex.

12. *Proctophyllodes stylifer* BUCHH. — On ?

13. *Aleurobius farinae* (L.). — In a box with turf and meal, in which meal-worms were bred, and in yolk-powder, Vegesack, numerous ex.

14. *Tyroglyphus longior* GERV. — On a ham, Vegesack, numerous ex.

15. *Carpoglyphus passularum* HERING. — On calabash-jam. Vegesack, numerous ex.

16. *Glycyphagus domesticus* (DE GEER). — On furniture, Vegesack, numerous ex.

17. *Dermacarus arvicolae* DUJARDIN, *hypopus*. — On *Arvicola glareolus*, Fuchsberg, June, 7 ex.

12. **Celeripes vespertilionis** (L.) tritonympha.

Synon.: *Pteroptus acuminatus* KOCH. Deu. Crust. Myr. Ar. 4, 21.
Pteroptus abominabilis KOCH, Deu. Cr. Myr. Ar. 4, 22.
Diplostaspis Nattererii KOLENATI in Sitz. ber. d. math. naturw. Classe der Kais. Akad. d. Wiss. (Wien) Bd. XXXV, p. 156, pl. 1, fig. 1.

There are only two so-called good species of *Celeripes*; viz.: *Celeripes vespertilionis* (L.), described and figured by BERLESE in his Acar. Myr. e Scorp. Ital., LIV, n⁰. 2 and

Celeripes euryalis (G. Can.), described and figured by Berlese in his Acar. Myr. e Scorp. Ital., LIV, n⁰. 3.

Pteroptus pilifer Neum., described by Neuman in his Om Hydrachnider, p. 11 in my opinion is synonym to *Celeripes vespertilionis* (L.)

Linné's *Acarus vespertilionis* includes certainly two species, viz. an *Acarus* and a *Nycteribia*. He placed it under *Pediculus* in his Fauna Suecica n⁰. 1951, and in his Syst. Nat. Ed. X, and says of it in his Systema Naturae, Ed. XII, n⁰. 9: «insolitae figurae, Phalangio simile». Two proofs, that he saw an animal with 6 very long legs. Moreover he cites Frisch and Scopoli.

Now Frisch, VII, VII, tab. VII. really saw a *Celeripes* (1728). Scopoli too, for, though he cites Linnaeus, he adds: «pedum numerus imprimis Acarum indicat». (*Acarus vespertilionis*, Entomologia carniolica n⁰. 1058, 1763).

The ancient writers on *Celeripes vespertilionis* most probably saw different animals or forms of animals, for some describe the body as rhombeous, others as round, one describes the female's abdomen with 4 or 6 hairs, another as with numerous hairs.

Berlese (loc. cit.) figures the dorsal shield of the ♂ of *Celeripes vespertilionis* (L.) on plate 2 different from that on plate 4. (Characteres generis Pteroptus). Consequently one of the two drawings is wrong, — or Berlese figured males of two different forms, — or the dorsal shield of the ♂ of *Celeripes vespertilionis* (L.) does not show always the same distribution and number of the round spots. But if so, Berlese should have mentioned this fact.

I make the same remarks as to the drawings of the dorsal shield of the ♀ (Berlese Ac. Myr Scorp. Ital. LIV, n⁰. 2 and 4).

Belese's drawings are sometimes inaccurate as to the reprentations of the form and distribution of the hairs in Acari. So I don't know whether the two species of *Celeripes* are delineated accurately by Berlese, but I doubt of it.

Neuman describes in his essay «Om hydrachnider», p. 11. *Pteroptus pilifer*, but whether this description is based on a male or on a female or on a nymph is not mentioned. I should say partly on a male (e. g. area genitalis pyriformis), partly on a female (e. g. margo posterior pilis densis instructus). At all events the description is too vague, and a figure is wanting. Yet, I think the species is synonym to *Celeripes vespertilionis* (L.).

If we compare the descriptions and figures of *Celeripes vespertilionis* (L.) of old writers, we observe that they differ in some details, and yet me must be prudent to assert that they saw different species.

If you compare my figures with KOCH's and KOLENATI's figures and descriptions, you will observe that I am right in considering *Pteroptus acuminatus* and *abominabilis* of KOCH, (not *abdominalis* as BERLESE writes!) and *Diplostaspis Nattererii* of KOLENATI as being synonyms to *Celeripes vespertilionis* (L.) tritonympha.

Nympha (*tritonympha*?) ♂, certe generans! On its *dorsal face* (fig. 32) we observe a dorsal shield marked with one median round spot and 28 smaller ones in four longitudinal rows, further symmetrically placed pores. What these round spots are I am unable to decide KOLENATI calls them Erosionsgruben, BERLESE foveolae. They disappear when the animal is treated with caustic kali. The shield is nearly rhombeous. Ten bristles surround the two foremargins of the shield; six smaller ones stand near the hind-corner of the shield, and two between the stigmata and the shield. The stigmata are dorsal, the peritremata run forward along the sides of the shield and bent themselves towards the ventral surface exactly between the 2d and 3d pairs of legs. — The palpi are slender, they reach the middle of the third joint of the first pair of legs. The legs are thick, as long as the body; the first three joints of the legs bear long, stiff, somewhat curved bristless. The 4th and 5th joints smaller ones. These bristles stand exactly in two longitudinal rows on the dorsal surface of each leg. In my figure this is not immediately perceptible, for the legs are bent sideways, and so the dorsal face of the first two pairs of legs is turned forward, whilst the same face of the last two pairs of legs is directed hindward.

Ventral face (fig. 33). The ventral shield shows a scaly marking, is broad pyriform, with its top directed towards te mouth. At its top is the genital aperture. Six small bristles on the shield, behind the shield 7 rows of small bristles, two of four, and five of 2 bristles; one post-anal bristle. First, second an third coxae with two small bristles each, fourth coxa with one bristle. Between the 2d and 3d coxae we observe, quite on the side of the body, the end of the peritrema.

Nympha (*tritonympha*?) ♀, certe generans! *Dorsal face.* (fig. 34.) The shape of the dorsal shield is more oval but shows *exactly the same distribution and number of round spots and pores!* It is surrounded by bristles, *placed exactly as in the male.* Compare fig 32 with 34. Only the hindmost two bristles are longer, and the six hindmost bristles are more remote one from another than in the male. The peritremata don't run so near the shield, as in the male.

Ventral face (fig. 35). The ventral shield is nearly rhombeous, with an acute angle forward and a blunt one hindward, with a scaly marking, and with 8 bristles. Further the ventral surface shows 10 pairs of bristles symmetrically arranged; one small post-anal bristle. The two hindmost bristles are longer than in the male. The abdomen is larger than in the male, swollen, and contained a large egg. The bristles on the coxae are the same as in the male. Between the 2d and 3d coxae the peritremata are visible, running a very little inward.

The *hairs*, both of the ♂ and ♀ nymphae are as if built from superposed small cylinders (fig. 36).

Why do I call these ♂ and ♀ nymphae generantes? Because in one of my so called males I saw another *Celeripes*! Consequently this male was just changing its skin! The hairs of the dorsal face of this *mature male* (fig. 37) were exactly corresponding in number and place those of the nympha, and all turned over the dorsum, towards the centre. The hairs of the legs however were all directed towards the claws. The most striking fact, however, is, that the ten hairs which surround the two foremargins of the dorsal shield in the adult are shaped quite otherwise than in the nympha! They are short, flat, lanceolated, and their margin denticulated (fig. 38).

I have not observed any dorsal shield in this adult male, therefore I am unable to tell anything about number and distribution of the round spots and pores. The bristles between the stigmata and the shield are much longer than in the nympha, and four of the hairs, which stand near the hind-angle of the shield, too. It seems to me that the adult animal is not frequent, being not necessary to the preservation of the species, the nymphae being generantes, an observation which is frequently made in Gamasids.

13. **Dermacarus arvicolae** Duj.

Dujardin (Annales des Sciences naturelles, 3^e^ Série, Zoologie, T. XII, p. 249 and p. 264, tab. 11, fig. 15, 16) badly describes and figures a hypopus under the name of *Hypopus arvicolae*. Since that date, 1849, it seems that this animal is not found again, at least not described and figured again and better. Mr. Poppe procured me seven specimens of this species.

In Das Tierreich, Sarcoptidae, this animal is placed in the genus *Dermacarus* Haller, and I think rightly, for it has like the hypopus of *Dermacarus sciurinus* (C. L. Koch) petioled suckers under the valvae of the fixing-apparatus.

The animal's outline is oval, somewhat pointed in front, blunt posteriosly. Its length is 0,325 mm.

The *dorsal surface* (fig. 39) shows a distinct line between cephalothorax and abdomen. The cephalothorax bears 6, the abdomen 10 very minute hairs.

The *ventral surface* (fig. 40) shows two very small hairs near the foremost margin, two palpiform tubercules at the spot where the animal's mouth must be, the epimera of the first pair of legs, forming an **Y**, the epimera between the first and the second pairs of legs, directed inward and hindward, but having between them a space of their own length, the epimera before the third pair of legs, bifurcated at both their ends, the anus, with two valves, each of them having two oblong suckers, three suckers behind the anus, of which the middle one is oval and larger than the others, and behind these three again four small suckers, forming a trapezium with its larger base directed towards the anus. Between the two suckers on the left and between those of the right side of this trapezium there is a very light-refracting and striated chitinous disk, which at first may be taken for a sucker. Further we observe the two valves of the fixing-apparatus. Underneath these two valves there is, as in the hypopus of *Dermacarus sciurinus* (C. L. Koch) a petioled sucker; the base of the sucker is circumvallated; the sucker itself is striated, refracting and apparently longitudinally split. On each side of the valvae there is a larger high refracting chitinous disk, which Dujardin took for a large sucker.

All the legs bear a strong claw; the claws of the fourth pair of legs, however, is smaller than the others. The forelegs bear a few feathered hairs on their proximal, and smooth hairs on their distal joints. The tarsi of the 1st, 2d and 3d legs bear moreover one long and four beautifull, curved lanceolated hairs, resembling those of *Tyroglyphus mycophagus*, *Trichotarsus japonicus* and *Trich. ornatus*. The tarsus of the 4th leg ends in a long hair, as long as the length of the cephalothorax.

14. **Acari**, collected by Dr. F. Heim.

Dr. F. Heim, of Paris, has sent me several Acari with the request to determinate them. As I consider the publication of my determinations useful to the knowledge of geographical distribution, I do so, with the approbation of the proprietor.

The Acari are:

1. *Seius vepallidus* (C. L. Koch), nympha generans. — On *Persica vulgaris*, *Cucumis melo*, feeding on *Tetranychus*, Buré, Meurthe et Moselle, 20 Sept. 1898. — 6 ex.

2. *Laelaps aculeifer* G. Can., nympha ♂. — Feeding on *Rhizoglyphus echinopus* Fum. et Rob. in a decaying *Crocus*-bulb. — 1 ex., Beaune-la-Rolande, Loiret, Septembre.

3. *Ixodes reduvius* (L.) — 2 ♂, 2 ♀, 1 nympha. — On *Homo sapiens*, *Canis familiaris*, *Lepus timidus*, Buré, Meurthe et Moselle, 1897.

4. *Trombidium gymnopterorum* (L.), larvae. — On *Phalangium opilio*, Buré, Meurthe et Moselle, August 1897.

5. *Trombidium holosericeum* L., larvae. — On *Homo sapiens*, *Canis familiaris*, *Gallina gallus*, Buré, Meurthe et Moselle, August 1896 and July 1897. — 15 ex.

6. *Bryobia praetiosa* Koch. — 18 ex — On *Arum maculatum*, *Sanguisorba*, *Lychnis*, Bois-de-Vincennes, Seine, 20 April 1894.

7. *Rhizoglyphus echinopus* Fum. et Rob. — 4 ex. — On *Crocus vernus*, Beaune-la-Rolande, Loiret, September.

15. On a strange feed of **Tyroglyphus longior** Gerv.

In Januari 1897 Prof. Sorauer of Berlin sent me a champignon which was pierced by burrows of an Acarus. In 1896 a gardener near Berlin suffered of immense loss of champignons bij these Acari. They proved to be *Tyroglyphus longior* Gervais.

Arnhem, 1 December 1899.